

WESTERN AUSTRALIAN COWRIES

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(Plates 2-5.)

The last of Charles Hedley's State lists of Mollusca was that dealing with the fauna of Western Australia published in 1916. He realized that Conchologically, this area was comparatively little worked, and that it offered an interesting field for future investigators: so that his list, although so carefully compiled, can be regarded only as a good pioneer effort.

The inter-tropical North-Western fauna differs considerably from the extra-tropical South-Western fauna, though there is an overlap of, say, 20% of the species. This percentage cannot be definitely decided until a more comprehensive and accurate faunal list is available. The fauna of the Dampierian region, extending in Western Australia from Shark Bay to Wyndham, has probably received even less attention from students than that of the Flindersian region, extending from Shark Bay South and East to South Australia, though both areas need much more investigation.

Fortunately, explorations made by Dr. J. C. Verco during 1910-1911 have added to our knowledge of this area, and specimens he collected on the beaches and by dredging are in the South Australian Museum.

As an example of the increased knowledge we now have of Western Australian molluscs, we may take the Cowries. Hedley listed forty species of true Cowries and relatives belonging to the Superfamily Cypracacea. As a consequence of intensive study, the nomenclature of the Cowries has become enlarged and stabilized, and now we are able to give a more accurate and comprehensive list. We find that Western Australia has about seventy different kinds of Cowries, and still a few more may remain to be discovered. It is not anticipated, however, that many new species will be found. In this paper, space and time permits only the illustration and some remarks on true Cowries, while the Eatoidae, Triviidae (Coffee Bean Shells), Amphipreratidae (Egg Cowries), all of which are represented in Western Australia, are simply listed.

FAMILY CYPRAEIDAE.

SUBFAMILY PUSTULARIIAE.

One species, *Pustularia globula*, with a callous on the spire and without granules, blotching or dorsal sulcus, is the Western Australian representative of this subfamily.

SUBFAMILY STAPHYLAEINAE.

Peculiar representatives of this sub-family is "Wrinkled Cowry" *Nuclearia nucleus* from N.W.A., a small flesh-coloured shell with a wrinkled and noded surface, and *Staphylaea staphylaea*, with its numerous small granular and spots.

SUBFAMILY UMBILINAE.

Umbilicate shells, known as "Wonder Cowries," live on our Southern Coast. The original specimen found was considered to be a monstrosity of the "Tiger" or "Panther Cowry," but an example later received by the British Museum, from Bass Strait, proved the species to be an authentic one. In

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S.W.A. a rare species, the "Apricot Cowry," *Umbilia hesitata armeniaca*, was dredged by the Federal trawler "Endeavour" in the Great Australian Bight in 100 fathoms. There is no specimen of the species in the South Australian Museum, and all shells labelled "*C. armeniaca*" examined by me in collections have proved to be the Tasmanian *U. hesitata*. It may be found by dredging in Western Australian waters. Of some 2,000 specimens of *U. hesitata* dredged in Bass Strait and examined by C. Kurtze, and many of them by myself, only a few verged to the *U. armeniaca* form.

The ecotype *U. hesitata howelli* Iredale 1931, (*U. hesitata alba* Cox 1880) has not yet been seen from the Flindersian region. Incidentally, there is a miniature white variant of this.

There are nine Tertiary species of this genus found in the Miocene and Pliocene.

SUBFAMILY ZOILINAE.

Another group of Cold-Water Cowries includes the well-known "Black Cowry," common in South Australia, living in a depression on a particular yellow sponge *Ecionemia robusta*. In S.W.A. is found the closely allied *Zoila thersites episema*, and in deeper water occurs *Z. contraria*, first dredged in 100 fathoms, ninety miles west of Eucla. A small relative is the "Dwarf Black Cowry," *Z. decipiens*, common in N.W.A. The most extraordinary one of the lot is *Z. rosselli* from Fremantle, a miniature "Black Cowry" with a keeled edge. On 10th March, while visiting the Nautical Museum, Port Adelaide, I was surprised to find two specimens of *Z. rosselli* on show, probably sent to that Institution by Mr. H. Russell of Perth. They are now in the Hartley Collection, Melbourne. This accounts for six specimens. It is said, however, that there is a seventh in the Australian Museum, from Cottesloe, W.A. Rather distinct from this group are the more elongated "Cold-Water Cowries," *Z. friendi* and the extremely rare *Z. vercoi*, the original three specimens of the latter being in the South Australian Museum, but Mr. H. Russell has now kindly added a fourth. There are four Tertiary fossil species of *Zoila*.

SUBFAMILY CYPRAEOVULINAE.

This sub-family includes a series of small Southern Australian shells, such as the "Peppered Cowry" *Notocypraea piperita*, "Verco's Cowry" *N. verconis*, somewhat like a common South African species, the "Flesh-coloured Cowry" *N. subcarnea* and the intricately marked "Mottled Cowry" *N. declivis occidentalis* from S.W.A. and N.W.A. A sinistral specimen of *N. declivis*, from Tasmania, is in the S.A. Museum Collection. It was noticed by Lt.-Col. R. J. Griffiths. Two fossil species somewhat like *N. piperita* are found in the Pliocene of South Australia. A narrower shell is the "Eucla Cowry" *Guttacypraea euclia* taken in 100 fathoms west of Eucla. It is greyish-white with fine teeth. A shallow water relative is *Guttacypraea pulcaria*, more common in S.W.A. than S.A.

SUBFAMILY AUSTROCYPRAEINAE.

A series of nine fossil species of this ancient genus ranges from the Lower to Middle Miocene, while the remarkable *A. reevei* of S.W.A. and S.A. is the only living representative. The animal is beautifully coloured, having a dark amber mantle beset with numerous three to five-pointed

filaments of a peculiar frost-like colour, and on the sides of the mantle are numerous narrow, rectangular black marks appearing to the naked eye as short vertical lines; the foot is amber, its posterior end pink, as are also the siphon and tentacles. All species have shells with a sculpture of hammer-like marks on the dorsum.

SUBFAMILY TALPARIINAE.

Three Cowries of striking colour pattern are found in this subfamily—all occurring in N.W.A. There is the small "Orange-tipped Cowry," *Basilitronea isabella*, the large "Eye Cowry," *Arestorides argus*, pale brown, three banded and covered with numerous brown rings, and the Mole Cowry, *Talparia talpa*.

SUBFAMILY ERRONEINAE.

Five genera of smaller Cowries are represented here. *Erronea* and *Palangerosa*, in which the shell margins are not spotted; *Ovatipsa* and *Blasicrura*, with spotted margins. *Ovatipsa* has coarse teeth and *Blasicrura* has fine teeth.

SUBFAMILY ADUSTINAE.

Five genera are found in Western Australia. *Solvadusta* has a small blotch and speckles and rounded base, *Gratiadusta* has a less rounded base. *Palmadusta* is colour banded. *Cribraria*, represented by the "Mesh Cowry" *C. fallax*, has white spots in a brown mesh, while an extraordinary species, *C. exmouthensis*, has the mesh pattern somewhat obscured. *Albacyprea* is white.

SUBFAMILY NARIINAE.

There are two genera, *Paulonaria*, with a dotted pattern, and *Evenaria*, banded. Both are found in N.W.A.

SUBFAMILY MAURITIINAE.

The first genus, *Mauritia*, is represented by the "Chocolate" or "Mauritius" Cowry, *Mauritia mauritiana* of N.W.A. and central Indo-Pacific, a thick, heavy shell with dark brown to almost black reticulations on its back. The "Arabic Cowry," *Arabica arabica*, has a beautiful medium-sized, dark brown shell, with intricate arabic markings on the back, and a close relative is the "Reticulate Cowry" *A. westralis*. Other species are the more elongate *A. perconfusa*, the smaller *A. scurra*, and also *A. depressa*, all found in N.W.A.

SUBFAMILY EROSARIINAE.

This is a sub-family of small Cowries, some of the species being very prolific. Four genera may be found in N.W.A., and two, *Erosaria* and *Ravitronea*, in S.W.A. as well. *Erosaria* and *Ravitronea* have a spotted colour pattern, the latter being a dark brown shell, of which the "Serpent's Head Cowry," *R. caputserpentis*, is an example. The "Money Cowry," *Monetaria moneta*, varies from a deep yellow to white, but has no colour pattern. The "Ringed Cowry," *Ornamentaria annulus scutellum*, is encircled by a deep red or orange ring. Some specimens have two and even the part of a third ring. Very small adult dwarfs of both species are found off various Pacific Islands.

SUBFAMILY CYPRAEINAE.

These are the typical Cowries, the type specimens being the pretty and plentiful "Tiger Cowry," *Cypraea tigris*. The "Lynx Cowry," *Lyncina lynx*, the "Egg Yolk Cowry," *Mystaponda vitillus*, the "Map Cowry," *Leporicypraea mappa*, and the "Pink-banded Cowry," *Ponda carneola sowerbyi*, a flesh-coloured pink-banded shell, all from N.W.A., complete the list of Western Australian species.

The following is a complete list of W.A. Cowries and their relatives:—

ERATOIDAE.

- Lachryma* Sowerby 1832. *Erato lachryma* Sowerby 1832.
denticulata (Pritchard & Gatliff) 1900. Vict. (type), Tas., S.A., S.W.A.
Cypraerato Schilder 1932. *Erato bimaculata* Tate 1878.
bimaculata (Tate) 1878. S.A. (type), Tas., S.W.A.

TRIVIIDAE

- Trivirostra* Jousseaume 1884. *Cypraea scabriuscula* Gray 1827.
oryzoides Iredale 1935. N.W.A. (type).
 = *Trivia oryza* Odhner 1917. Not *oryza* Lamarck.
paragrande Iredale 1935. N.W.A. (type).
 = *Trivia grande* Odhner 1917. N.W.A. (type).
Dolichupis Iredale 1930. *Cypraea producta* Gaskoin 1836.
obscura (Gaskoin) 1849. N.W.A. (type).
 = *Trivia bipunctata* (Odhner) 1917. N.W.A. (type).
Cleotrivia Iredale 1930. *Cypraea pilulu* Kiener 1845.
bathypilula Iredale 1935. S.W.A. (type).
 = *Trivia globosa* Verco 1918, not Gray.
Ellatrivia Iredale 1931. *Triviella merces* Iredale 1924.
merces (Iredale) 1924. N.S.W. (type), Vict., Tas., S.A., S.W.A.
 = *Cypraea australis* Lamarck 1822. Not Schoeter 1804.

AMPHIPERATIDAE

SUBFAMILY AMPHIPERATINAE.

- Amphiperas* Meuschen 1781. *Bulla ovum* Linne 1758.
ovum (Linne) 1758. Amboina (type), N.A., Q., N.S.W.
Pellasinia Iredale 1931. *Ovulum angasi* Reeve 1865.
verconis (Cotton and Godfrey) 1932. S.A. (type D.13476, S.A. Mus.), S.W.A.
depressa (Sowerby) 1875. N.W.A. (type).

SUBFAMILY VOLVINAE.

- Volva* Boltin 1798. *Bulla volva* Linne 1758.
 = *Radius* Montfort 1810 = *Birostra* Swainson 1840.
volva (Linne) 1758. Q., N.W.A., N.A.
 = *Volva textoria* Boltin 1798.
Phenacovolva Iredale 1930. *Phenacovolva nectarea* Iredale 1930.
haynesi (Sowerby) 1889. N.W.A. (type).
praenominata Iredale 1935. N.W.A. (type).
 = *Radius gracillimus* Schilder 1927, not Smith 1901.
exsul Iredale 1935. S.W.A. (type).
 = *Ovula philippinerum* Verco 1912.

CYPRAEIDAE
SUBFAMILY PUSTULARIINAE.

Pustularia Swainson 1840. *Cypraea cicercula* Linne 1758.
globulus (Linne) 1758. N.W.A.

SUBFAMILY STAPHYLAEINAE.

Staphylaea Jousseaume 1884. *Cypraea staphylaea* Linne 1758.
staphylaea (Linne) 1758. Mauritius (type), Q., N.S.W., N.A., N.W.A.
Nuclearia Jousseaume 1884. *Cypraea nucleus* Linne 1758.
nucleus nucleus (Linne) 1758. N.W.A., Q., N.A.

SUBFAMILY UMBILINAE.

Umbilia Jousseaume 1884. *Cypraea umbilicata* Sowerby 1825.
hesitata armeniaca (Verco) 1917. S.W.A. (type).

SUBFAMILY ZOILINAE.

Zoila Jousseaume 1884. *Cypraea friendi* Gray 1831.
friendi friendi (Gray) 1831. S.W.A., Swan River (type).
= *Cypraea scotti* (Broderip) 1832.
friendi vercoi Schilder 1930. S.W.A., Esperance (type D.14124, S.A. Mus.).
thersites thersites (Gaskoin) 1848. S.A. (type).
= *Cypraea marginata* Gaskoin 1848.
thersites contraria Iredale 1935. S.W.A. (type). Deep water.
thersites venusta (Sowerby) 1847. N.W.A. (type).
= *Cypraea thatcheri* Cox 1869.
= *Cypraea bakeri* Gatliff 1916.
= *Cypraea brunnea* Cox 1889.
thersites episema Iredale 1939. S.W.A. (type).
decipiens (Smith) 1880. N.W.A. (type).
rosselli (Cotton) 1948. S.W.A., Fremantle (type D.14220, S.A. Mus.).

SUBFAMILY CYPRAEOVULINAE.

Notocypraea Schilder 1927. *Cypraea piperita* Gray 1825.
piperita (Gray) 1825. S.A. (type), S.W.A., N.S.W., Vict., Tas.
bicolor (Gaskoin) 1849. Tas. (type), Vict., S.A., S.W.A., N.S.W.
mayi (Beddome) 1898. Tas. (type), S.A., S.W.A., N.S.W., Vict.
declivis occidentalis Iredale 1935. S.W.A., Geographie Bay (type); N.W.A.
subcarnea (Beddome) 1896. Tas. (type), S.A., S.W.A., N.S.W., Vict.
= *Cypraea albata* Beddome 1897.
verconis Cotton and Godfrey 1932. S.A. (type D.13474, S.A. Mus.), S.W.A., N.W.A., N.S.W., Vict.
Guttacypraea Iredale 1935. *Cypraea pulicaria* Reeve 1846.
pulicaria (Reeve) 1846. S.W.A. (type), S.A.
= *Guttacypraea pulicaria candida* Coen 1949.
eucليا Steadman & Cotton 1946. S.W.A., 100 fms., 40 miles W. of Eucla (type D.11634, S.A. Mus.).

SUBFAMILY AUSTROCYPRAEINAE.

Austrocyprea Cossmann 1903. *Cypraea contusa* McCoy 1877 (fossil).
= *Prolyncina* Schilder 1927. *Cypraea reevei* Sowerby 1832 (recent).
reevei (Sowerby) 1832. S.W.A. (type), S.A.

SUBFAMILY TALPARIINAE.

- Talparia* Troschel 1863. *Cypraea talpa* Linne 1758.
talpa (Linne) 1758. Amboina (type), N.W.A.
Basilitronea Iredale 1930. *Cypraea isabella* Linne 1758.
isabella isabella (Linne) 1758. N.W.A., Q., N.S.W., N.A.
 = *Basilitronea isabella rumphi* Schilder and Schilder 1939.
Arestorides Iredale 1930. *Cypraea argus* Linne 1758.
argus argus (Linne) 1758. N.W.A.
 = *Cypraea argus contrastriata* (Perry) 1811.

SUBFAMILY ERRONEINAE.

- Erronea* Troschel 1863. *Cypraea erronea* Linne 1758.
nimisserans nimisserans Iredale 1935. Q. (type), N.S.W., N.A., N.W.A.
nimisserans coxi (Brazier) 1872. N.W.A., Depuch Is. (type).
magerrones proba Iredale 1939. N.W.A. (type), N.A.
Palangerosa Iredale 1930. *Cypraea cylindrica* Born 1780.
cylindrica sista Iredale 1939. N.W.A. (type).
Ovatipsa Iredale 1931. *Cypraea chinensis* Gmelin 1791.
caurica blaesa Iredale 1939. N.W.A. (type), N.A.
chinensis variolaria (Lamarck) 1810. Amboina (type), N.W.A.
Blasicrura Iredale 1930. *Cypraea rhinoceros* Souverbie 1865.
irvineanae (Cox) 1890. S.W.A., Cape Naturalist (type).
Bistolida Cossmann 1930. *Cypraea stolidia* Linne 1758.
stolidia stolidia (Linne) 1758. Ceylon (type), Broome, N.W.A.
quadrinaculata (Gray) 1824. Amboina (type), N.W.A., N.A.

SUBFAMILY ADUSTINAE.

- Palmadusta* Iredale 1930. *Cypraea clandestina* Linne 1758.
clandestina (Linne) 1767. N.W.A. (type).
lutea bizonata Iredale 1935. N.W.A. (type).
Gratiadusta Iredale 1930. *Cypraea pyriformis* Gray 1825.
pyriformis pyriformis (Gray) 1825. N.W.A., Q., N.A. (type).
pyriformis smithi (Sowerby) 1881. N.W.A. (type).
kaiseri (Kenyon) 1897. N.W.A. (type), N.A., Q.
walkeri comptoni (Gray) 1847. N.A. (type), N.W.A.
Solvadusta Iredale 1935. *Gratiadusta vaticina* Iredale 1930.
subviridis subviridis (Reeve) 1835. N.Q. (type), N.A., N.W.A.
 = *Adusta dorsalis* Schilder & Schilder 1938.
Albaecypraea Cotton & Steadman 1946. *Cypraea eburnea* Barnes 1828.
eburnea (Barnes) 1828. Fiji (type), Manus, New Guinea, Q., N.A.
 N.W.A.
Cribraria Jousseaume 1884. *Cypraea cribraria* Linne 1758.
cribraria fallax (Smith) 1881. N.W.A., S.W.A.
cribraria exmouthensis (Melvill) 1888. N.W.A. (type).

SUBFAMILY NARIINAE.

- Paulonaria* Iredale 1930. *Cypraea beckii* Gaskoin 1836.
 = *Opponaria* Iredale 1939. = *Cupinota* Iredale 1939.
macula hilda Iredale 1939. N.W.A., Shark Bay (type).

- Eyenaria* Iredale 1930. *Cypraea asellus* Linne 1758.
asellus (Linne) 1758. Amboina (type), N.W.A., N.A.
punctata carula Iredale 1939. N.A., Q. (type), N.W.A.
hirundo cameroni Iredale 1939. N.A. (type), N.W.A., Q., N.S.W.

SUBFAMILY MAURITIINAE.

- Mauritia* Troschel 1863. *Cypraea mauritiana* Linne 1758.
mauritiana regina (Gmelin) 1791. N.W.A., Central Indo-Pacific.
Arabica Jousseaume 1884. *Cypraea arabica* Linne 1758.
arabica arabica (Linne) 1758. N.A., N.W.A., Q.
arabica westralis Iredale 1935. N.W.A. (type), N.A., Q.
eglantina perconfusa Iredale 1935. N.W.A. (type), N.A., Q.
seurra seurra (Gmelin) 1791. N.W.A., N.A., Q.
= *Cypraea indica* Gmelin 1791.
= *Cypraea amarata* Morch 1852.
depressa depressa (Gray) 1824. N.W.A., N.A., Q.
= *Cypraea intermedia* Redfield 1847.
= *Cypraea gillei* Jousseaume 1893.

SUBFAMILY EROSARIINAE.

- Erosaria* Troschel 1863. *Cypraea erosa* Linne 1758.
erosa phagedaina (Melvill) 1888. N.W.A., S.W.A.
inocellata diversa (Kenyon) 1902. N.W.A., Shark Bay (type D.3903, S.A. Mus.).
Ravitrana Iredale 1930. *Cypraea caputserpentis* Linne 1758.
caputserpentis caputserpentis (Linne) 1758. N.W.A., S.W.A., N.S.W., Q., N.A.
caputserpentis kenyonae Schilder & Schilder 1919. N.W.A. (type).
helvola citrinicolor Iredale 1935. N.W.A. (type).
wilhelmina (Kenyon) 1897. N.W.A. (type D.14447, S.A. Mus.).
Monetaria Troschel 1863. *Cypraea moneta* Linne 1758.
= *Aricia Broderip* 1837.
moneta moneta (Linne) 1758. N.W.A.
moneta rhomboides Schilder & Schilder 1933. N.W.A. (type).
Ornamentaria Schilder & Schilder 1936. *Cypraea annulus* Linne 1758.
annulus scutellum Schilder & Schilder 1937. N.W.A.

SUBFAMILY CYPRAEINAE.

- Cypraea* Linne 1758. *Cypraea tigris* Linne 1758.
tigris tigris Linne 1758. N.W.A. (type), N.A., Q.
Lyncina Troschel 1863. *Cypraea lynx* 1758.
lynx lynx (Linne) 1758. N.W.A., Q.
= *Cypraea vanelli* Linne 1758.
= *Cypraea michaelis* Melvill 1905.
Mystaponda Iredale 1930. *Cypraea vitellus* Linne 1758.
vitellus vitellus (Linne) 1758. N.W.A., N.A., S.W.A., N.S.W.
= *Cypraea distorta* Cox 1889. procc.
Leporicypraea Iredale 1930. *Cypraea mappa* Linne 1758.
mappa mappa (Linne) 1758. N.W.A., N.A., Q.
= *Mauritia geographica* Schilder & Schilder 1934.

Ponda Jousseaume 1884. *Cypraea ventriculus* Lamarck 1810:
carneola sowerbyi (Anton) 1839. N.W.A.
= *Cypraea loebbeckeana* (Weinkauff) 1881.

PLATE 2.

Umbilia hesitata armeniaca (Verco).
Zoila thersites episema Iredale.
Zoila decipiens (Smith).
Zoila friendi vercoi Schilder.
Zoila friendi (Gray).
Zoila rosselli Cotton.

PLATE 3

Nuclearia nucleus (Linne).
Guttacypraea pulicaria (Reeve).
Notocypraea occidentalis Iredale.
Notocypraea piperita (Gray).
Notocypraea verconis Cotton & Godfrey.
Austocypraea reevei (Sowerby).

PLATE 4.

Basilitrona isabella (Linne).
Arestorides argus (Linne).
Erronea nimisserans Iredale.
Palangerosa cylindrica sista Iredale.
Solvadusta subviridis (Reeve).
Cribraria cribraria exmouthensis (Melvill).

PLATE 5.

Mauritia mauritiana regina (Gmelin).
Arabica scurra (Gmelin).
Ravitronea caputserpentis kenyonae Schilder & Schilder.
Cypraea tigris Linne.
Mystaponda vitellus (Linne).
Ponda carneola sowerbyi (Anton).

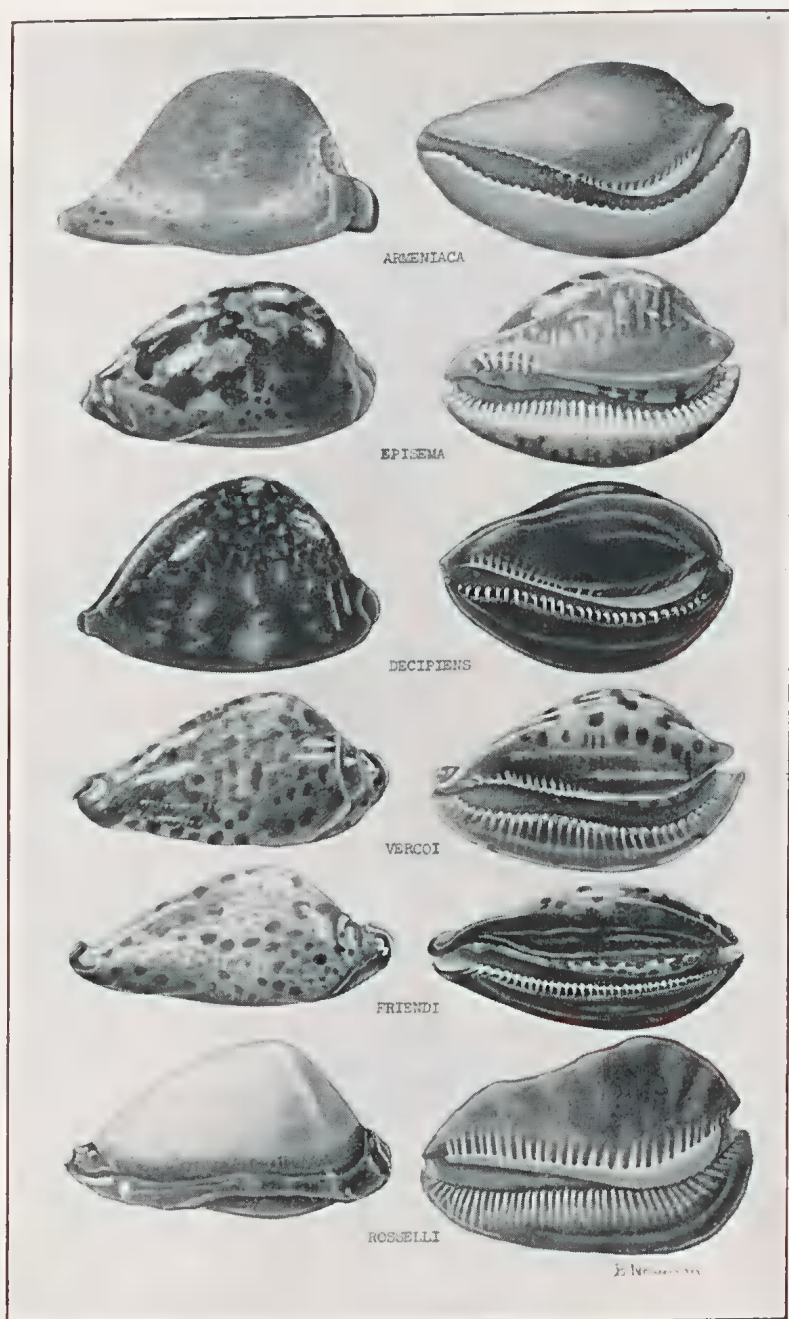


Plate 2.

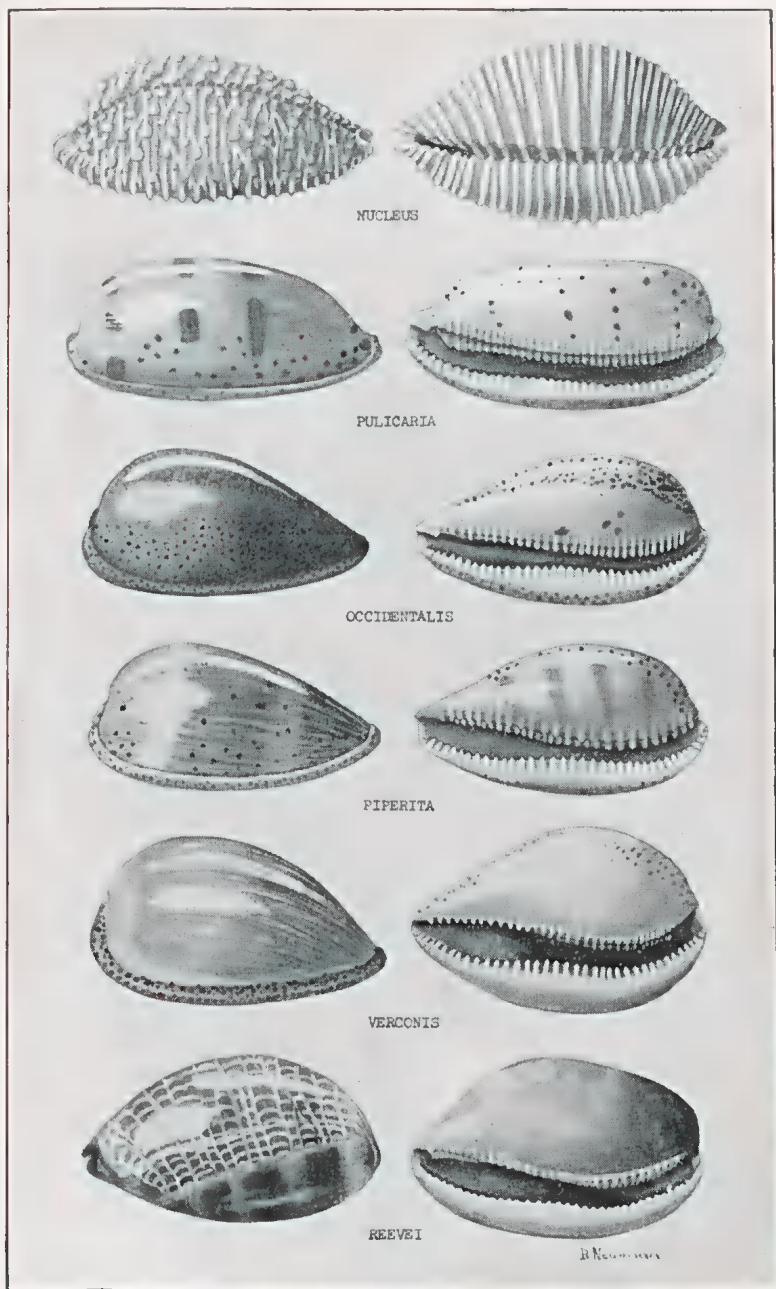


Plate 3.

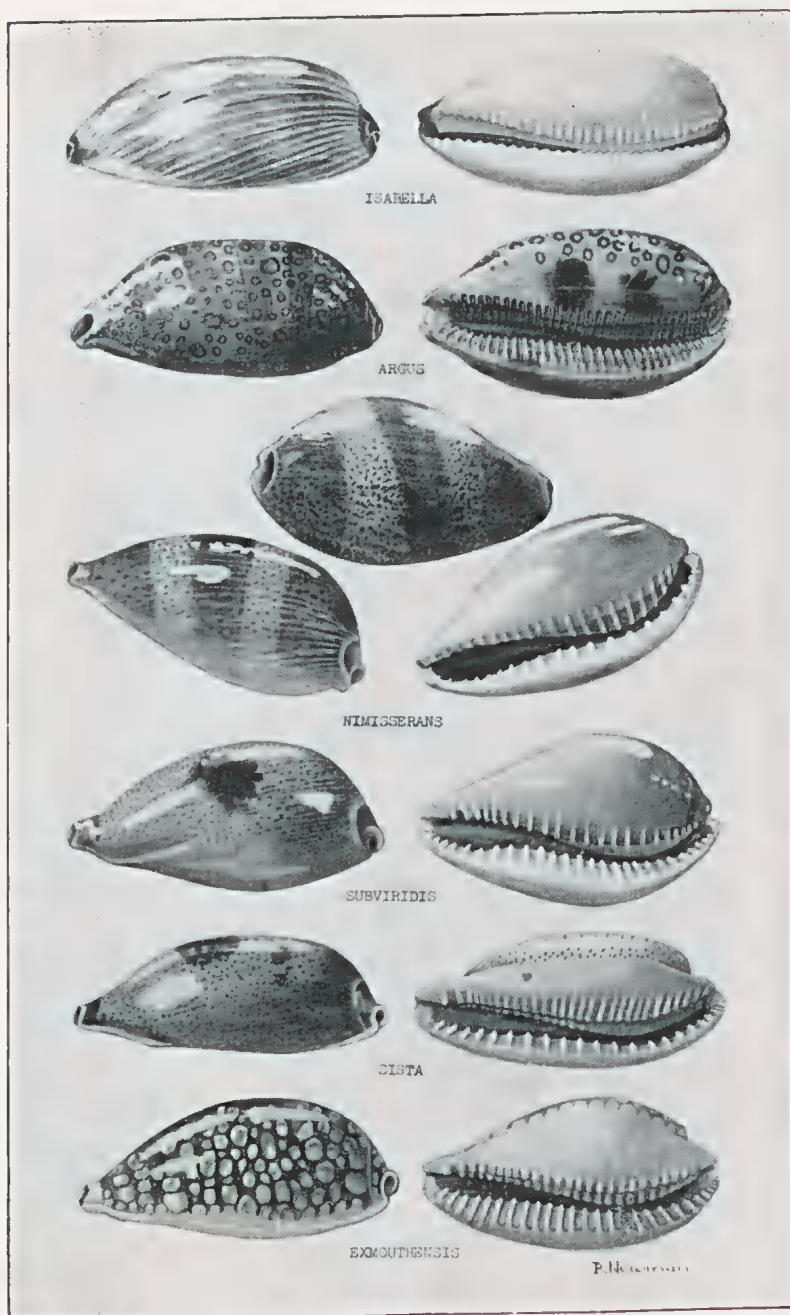


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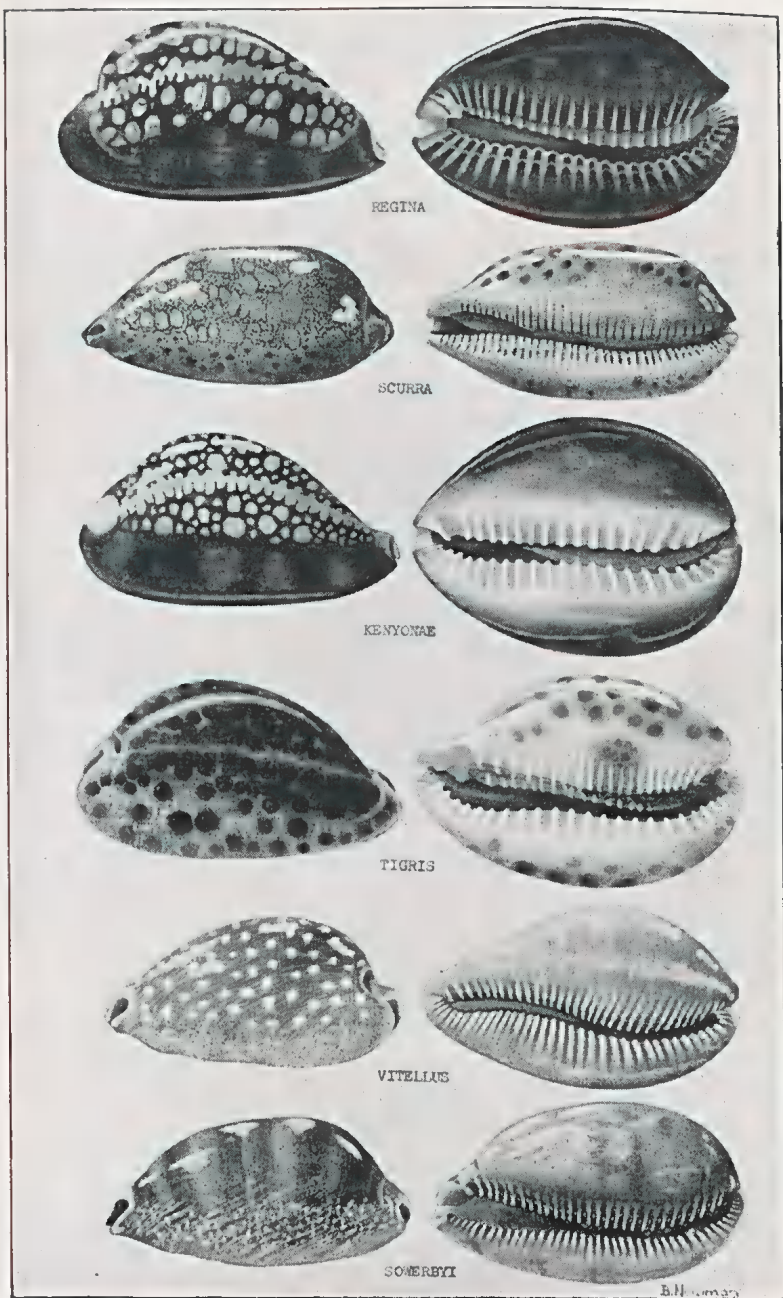


Plate 5.